

**CLAIMS**

We claim:

1. A method for reading data from a data storage system, comprising:
  - 5 storing a plurality of copies of the data at a respective plurality of data storage units;  
receiving at a data port an access request submitted by a host to receive the data;  
transmitting from the port, in response to the  
10 access request, a plurality of delivery requests for the data to the respective plurality of data storage units;  
transmitting from the plurality of data storage units to the port respective responses to the delivery requests, the responses comprising the data;  
15 accepting at the port an earliest-arriving response comprising the response to the delivery requests arriving first at the port; and  
forwarding from the port to the host the data comprised in the earliest-arriving response.
- 20 2. The method according to claim 1, wherein the data port comprises a cache adapted to store the data, and wherein receiving the access request comprises performing a check that the data is stored in the cache, and transmitting the data from the cache in response to the  
25 check.
3. The method according to claim 1, wherein the data port comprises a memory having a fast access time, and wherein the data storage units comprise units having slow access times.
- 30 4. The method according to claim 1, wherein the plurality of storage units comprise a sub-set of a multiplicity of storage units, and comprising determining

the storage units comprised in the sub-set.

5. The method according to claim 1, wherein transmitting the plurality of delivery requests comprises determining a measure of a capability of at least some of the storage units to fulfil the delivery requests, and transmitting the delivery requests in response to the measure.

6. The method according to claim 5, wherein determining the measure comprises measuring an activity of at least one of the storage units.

7. The method according to claim 6, wherein measuring the activity of at least one of the storage units comprises checking that the activity is different from a threshold activity.

8. The method according to claim 5, wherein determining the measure comprises measuring a length of a data request queue of at least one of the storage units.

9. The method according to claim 8, wherein measuring the length of the data request queue comprises checking that the length is different from a threshold length.

10. The method according to claim 5, wherein determining the measure comprises measuring an activity and a length of a data request queue of at least one of the storage units.

11. The method according to claim 5, wherein the measure comprises a substantially instantaneous measurement.

12. The method according to claim 5, wherein the measure comprises a measurement taken over an extended period of time of the order of minutes.

13. The method according to claim 1, wherein the data storage units comprise memories having fast access times.

14. The method according to claim 1, wherein transmitting the plurality of delivery requests comprises transmitting the delivery requests as a single delivery request receivable by the plurality of data storage  
5 units.

15. The method according to claim 1, wherein transmitting the plurality of delivery requests comprises transmitting all the requests within a period of less than approximately ten milliseconds.

10 16. A data storage system, comprising:

a plurality of data storage units wherein are stored a respective plurality of copies of data; and

a data port which is adapted to:

15 receive an access request for the data from a host,

transmit, in response to the access request, a plurality of delivery requests for the data to the respective plurality of data storage units,

20 receive from the plurality of data storage units respective responses to the delivery requests, the responses comprising the data,

accept an earliest-arriving response comprising the response to the delivery requests arriving first at the port, and

25 forward to the host the data comprised in the earliest-arriving response.

17. The system according to claim 16, wherein the data port comprises a cache adapted to store the data, and wherein receiving the access request comprises performing  
30 a check that the data is stored in the cache, and transmitting the data from the cache in response to the check.

18. The system according to claim 16, wherein the data

port comprises a memory having a fast access time, and wherein the data storage units comprise units having slow access times.

19. The system according to claim 16, wherein the  
5 plurality of storage units comprise a sub-set of a multiplicity of storage units, and wherein the data port is adapted to determine the storage units comprised in the sub-set.

20. The system according to claim 16, wherein  
10 transmitting the plurality of delivery requests comprises determining a measure of a capability of at least some of the storage units to fulfil the delivery requests, and transmitting the delivery requests in response to the measure.

15 21. The system according to claim 20, wherein determining the measure comprises measuring an activity of at least one of the storage units.

22. The system according to claim 21, wherein measuring the activity of at least one of the storage units  
20 comprises checking that the activity is different from a threshold activity.

23. The system according to claim 20, wherein determining the measure comprises measuring a length of a data request queue of at least one of the storage units.

25 24. The system according to claim 23, wherein measuring the length of the data request queue comprises checking that the length is different from a threshold length.

25. The system according to claim 20, wherein determining the measure comprises measuring an activity  
30 and a length of a data request queue of at least one of the storage units.

26. The system according to claim 20, wherein the

measure comprises a substantially instantaneous measurement.

27. The system according to claim 20, wherein the measure comprises a measurement taken over an extended  
5 period of time of the order of minutes.

28. The system according to claim 16, wherein the data storage units comprise memories having fast access times.

29. The system according to claim 16, wherein transmitting the plurality of delivery requests comprises  
10 transmitting the delivery requests as a single delivery request receivable by the plurality of data storage units.

30. The system according to claim 16, wherein transmitting the plurality of delivery requests comprises  
15 transmitting all the requests within a period of less than approximately ten milliseconds.